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2013/2012 : •

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فهرس المحتويات

فهرس المحتويات

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10	"P.A.Samuelson" ·
10	" N.Kaldor" ·
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26	2005-1950` 1913-1870`	1.1
29	2005-1948`	2.1
42		1.2
47	2.2
71	1980	1.3
74		2.3



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21	.	1.1
23		2.1
40	UNCTAD	1.2
41		2.2
53		3.2
72	1985-1960.	1.3
75		2.3
77	.2006-1998.	3.3

المقدمة العامة

A Process of Structural

(Ros, 2000)

"Transformation

(Lewis, 1954) "Modern

(Ocampo, 2007)

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(Green Revolution

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(Rodrik, 2007)

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(Ocampo and Vos,2008)

Y (2004) Keller (Temple and Voth, 1997)

%90

Two-Gap Models

Chenery and Bruno, 1962 ;)

(Mackinnon, 1964 ; Taylor, 1990, 1993 ; Bacha , 1994

(1989) Amsden

()

Learning Foreign Technology

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Amsden (Amsden, 1989 :05)"

Technological innovation

Economic Growth

Capital good imports



catch-up

(2005) Alvarez & Lopez •

(TFP)

(2009) Seker •

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(1988) Lucas و (1986) Romer

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Rivera-Batiz & (1991) Grossman & Helpman

(1990) Quah & Rauch و (1991) Romer

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الفصل الأول

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:"P.A.Samuelson" •

"P.A.Samuelson "

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:" N.Kaldor" •

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"N.Kaldor"

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(190 2005)

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(57 :2011.)

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"J.Lecaillon "

L K

(Lecaillon, 1986, P67)

Gross National Income Per)

(Capita

i

%50

(1999 - 2010)

(Exogenously)

1962 (Learning By Doing) (Arrow)

1983 (Romer) (Kaldor)

.1

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(Imperfect Competition) .3

(1986)

(Capital Accumulation)

(Silicon Chip)

(Arrow)

Silicon Chip

Learning By)"

(King and Robson-1989) i(Watching

Silicon Chip \hat{O}

i(Human Capital)

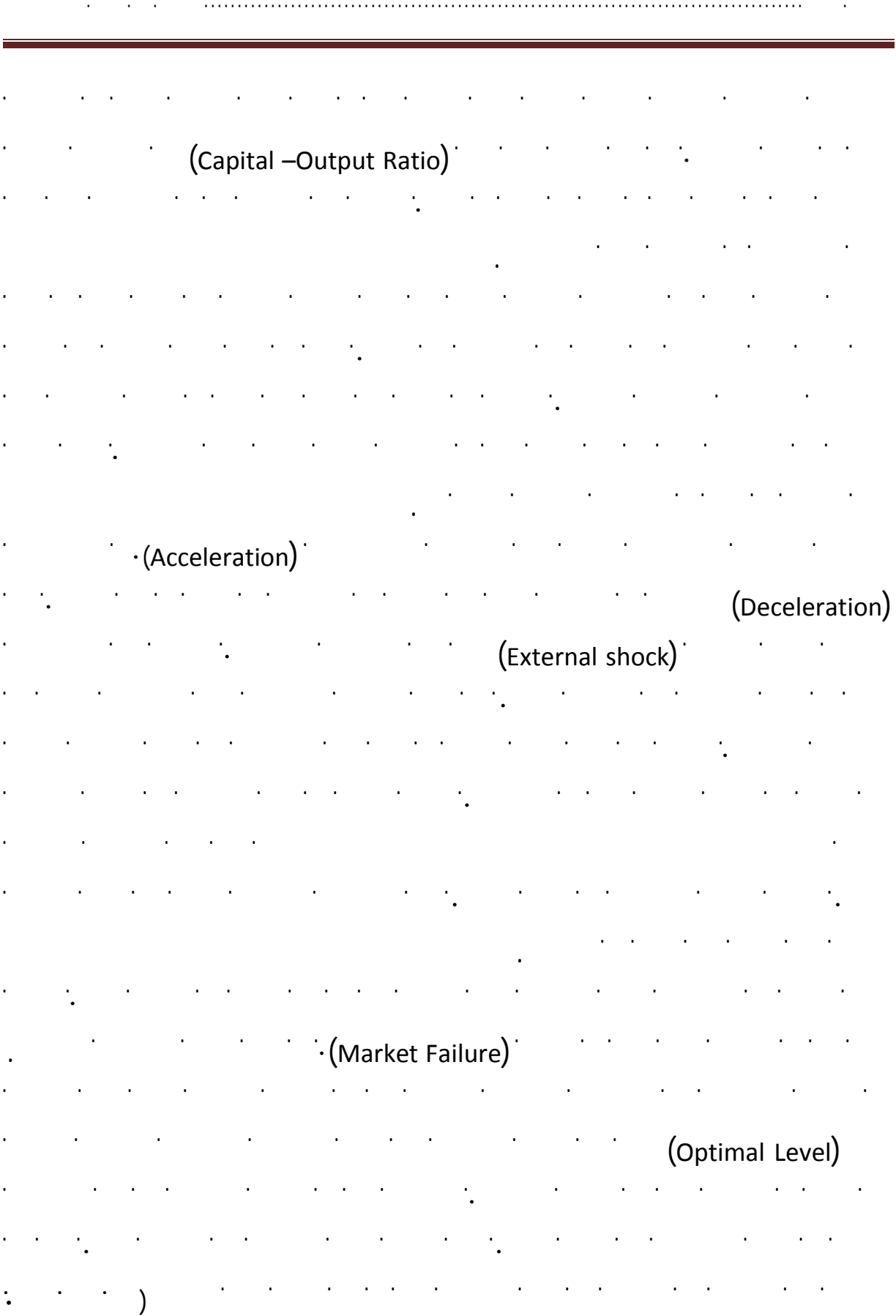
Research)

(and Development

(Public Investment)

(Important Implications)

(Empirical Observation)



(104-101) 2010



.....

$(\frac{\Delta A}{A})$ (Productivity Growth)

(Autonomous Change) (A Proxy)

(The Residual Element)

(Inputs) (Exogenous) (Empirical Studies)

.....

(Endogenizing it)

(Romer, 1986 , Lucas, 1988)

(1962) (Arrow)

.....

(A Permanent Effect)

(A)

(A)

(Catching Up)

(Convergence)

$\left(\frac{K}{L}\right)$

(Foreign Capital)

(MK)

(GDP)

(109 : 108 · 2010 ·)

(Level Of Education)

(1988)

(Lucas)

(H)

(Positive Externalités)

Aggregate)

(Public Infrastructures)

(Residual Elements)

(Production Function

1990 1820

(Robert Solow)

.1870

(Technological Progress)

Paul)

.1990 1986(Romer

(Exogenous Increases In Productivity)

.1

(Sustainable Growth)

.2

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.(1991) (Jovanvic)

(1992) (Lyons) (Caballero)

1990

(Patents)

(1991) Krugman and Helpman (1992) Aghion and Hewitt
 (Creative Destruction Dimension)

(Schumpeter)

Aghion and) (Howitt, 1991, 1998

(1988) Robert Lucas

) ()

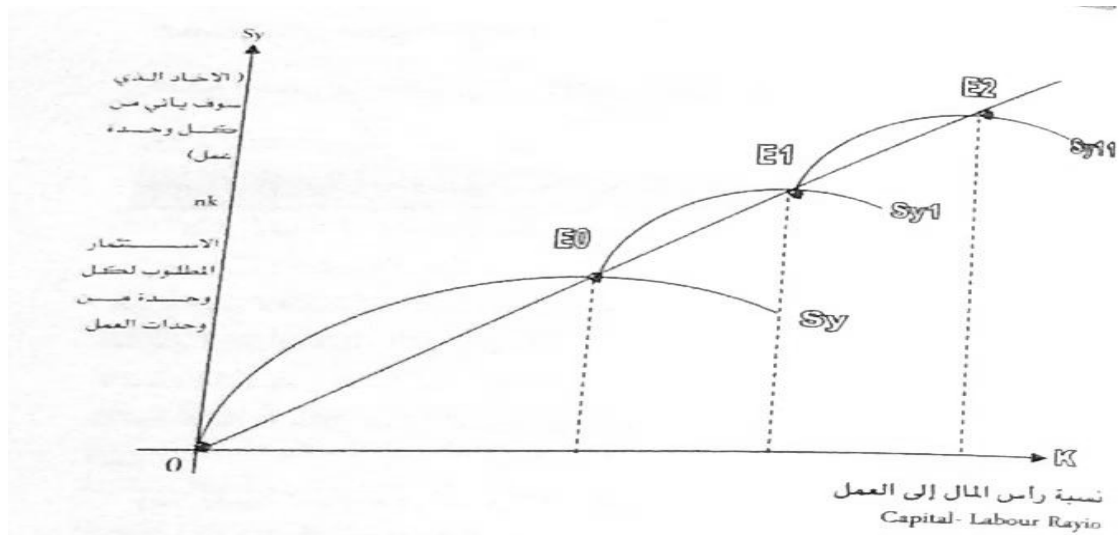
() (Institutional Differences)

i(

sy11 sy1 sy

$K_2^* K_1^* K_0^*$

:(1.1



.(117 ·2010).

$$\left(\frac{G}{GDP}\right)$$

$$\left(\frac{1}{GDP}\right)$$

$$\left(\frac{C_g}{GDP}\right)$$

(118-111 : 2010 :

$$\left(\frac{E_x}{GDP}\right)$$

(Comparative Advantage)

2

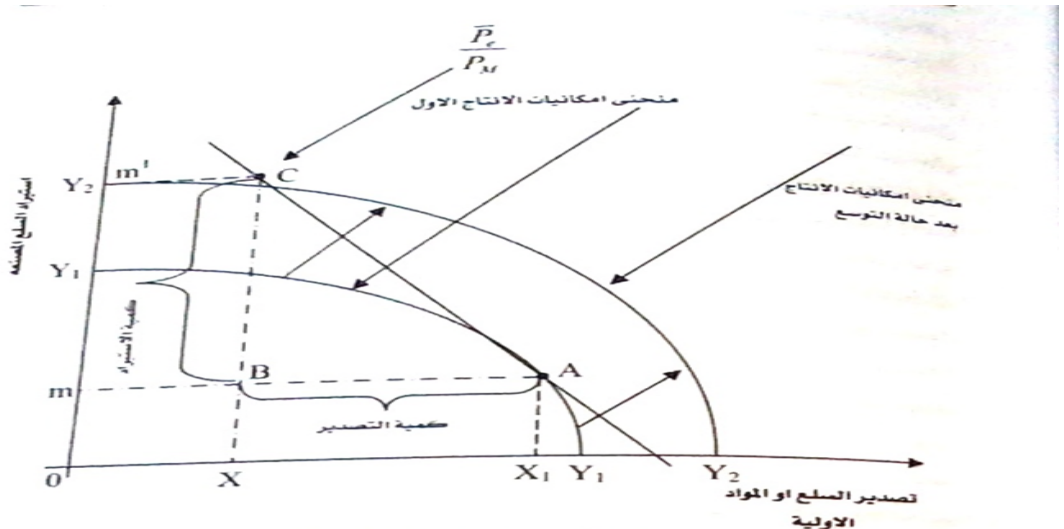
(Primary Product)

()

(Hla Myint)

(Vent for Surplus)

(2.1):



شكل يبين نظرية منقذ الفائض (Vent for Surplus Theory)

(2010 : 141).

(B)

$$\left(\frac{P_e}{P_m}\right)$$

(A)

(B)

(BC)

(AB)

(C)

(B)

(m)

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(Export Enclave)

(Diversified Economy)

(Self-Reliant Economy)

(Skilled Manpower)

(A) (B) (Production Possibilities Curve)

(Y₂Y₂) (Y₁Y₁)

(Backward Linkages)

(Forward Linkages)

3

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1883

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(I.B.Kravis) (1965_1955) (1929_1883)

(Periphery)"

(244 -240 :2010 ;)

.1

(Growth-Led Export Hypothesis) "ELGH"

(284 :2002:) :



62 1913-1870 34

2005-1950

1913-1870 : (1.1)

2005-1950 ()

	2005	1998	1950		1913	1870	
/1950 2005				/1870 1913			
3,8	41456	33726	5336	2,1	2705	1102	
6,2	8043	5817	296	3,4	212,4	50,3	
	19,4	17,2	5,5		7,9	4,6	

Source: WTO, World Trade Report. (2007, p264)

: .2

(Export-Led Growth Hypothesis)"GLEH" $\hat{\Omega}$



(284 :2002:)

41 (Mechaely) (1977) ➤

18 : 23

(Balassa) (1979) ➤

110

(Tayler) (1982) ➤

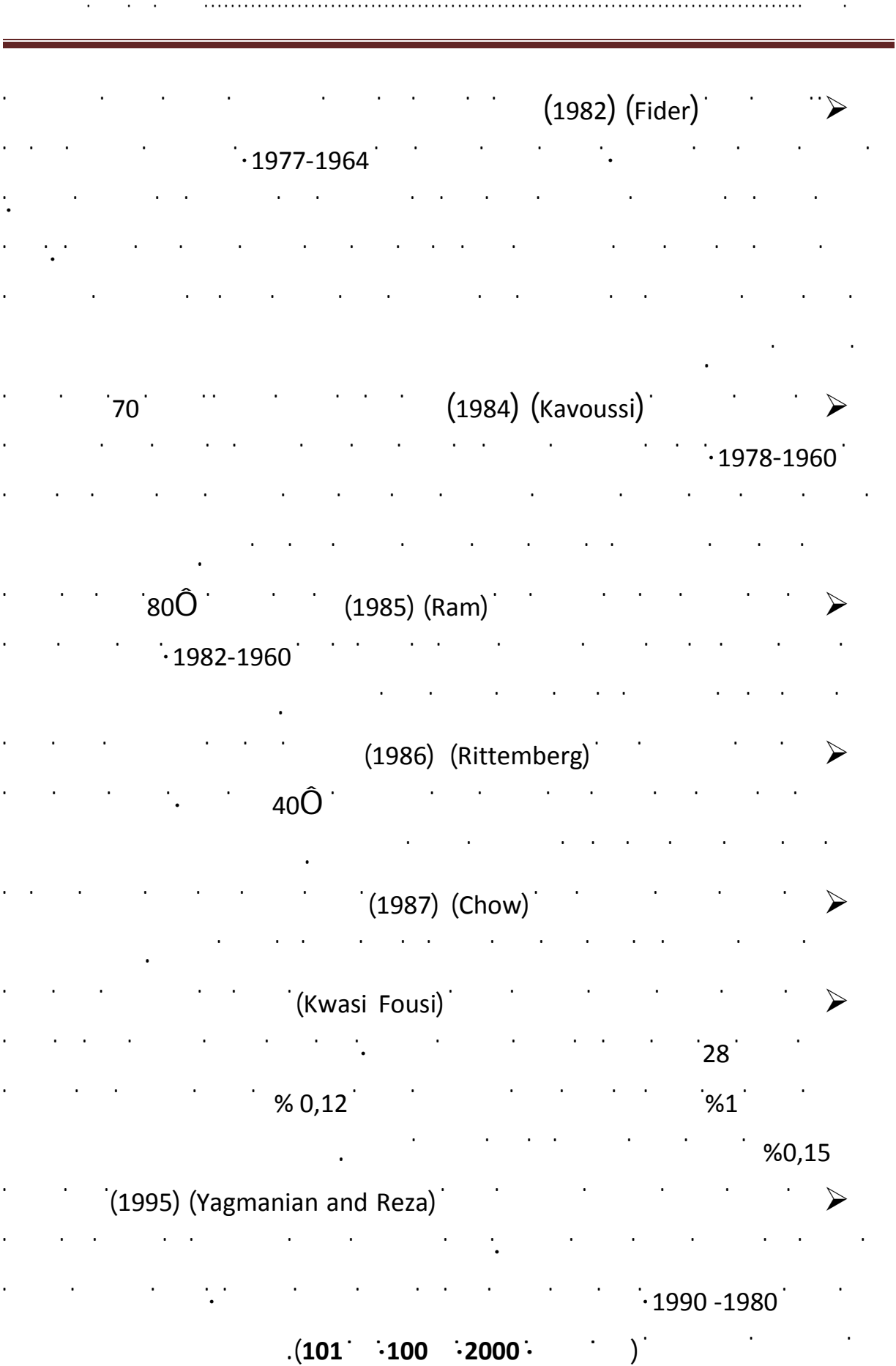
1977-1960 55

%48 % 49

% 50 %55

%1 %17,5

(42 :2006:)%1 % 18,2



1990 (Rom) 1991 (Esfqhni)

(71 (2009)):

2005-1948 : (2.1)
()

2005	2003	1993	1983	1973	1963	1953	1948	
10159	7347	3675	1838	579	157	84	59	

Source: WTO, World Trade Report. (2007, p215)

(96 '2008:)

(Harrod-domar)

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(Mizelz)

(26 '2005:)

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(Logy)

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$$\frac{1}{\dots} = (\dots)$$

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(1986)

	2007	2000	WIPO	2007
35	.33	.26	23	.39
ñ17	% 28	% 40		% 31
	0,19	0,6	.2007	
	.1,02		2,3	
	.0,7	1,4		
	11,9	1,6		
	(2007)2,4		
2007	2000		WIPO	
15				630

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:) % 1
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.(.....) % 87Ô :

% 28

%0,6 %10

ñ 38

%. 10,4 % 6

(البرهان، 2011، ص18).

(Archibugi and coco, 2004, 2005)

(Tai)

UNDP

(UNDP, 2004)

UNIDO,)

(2002, p47)

(RAND)

(Wagner et al, 2001)

(UNCTAD)

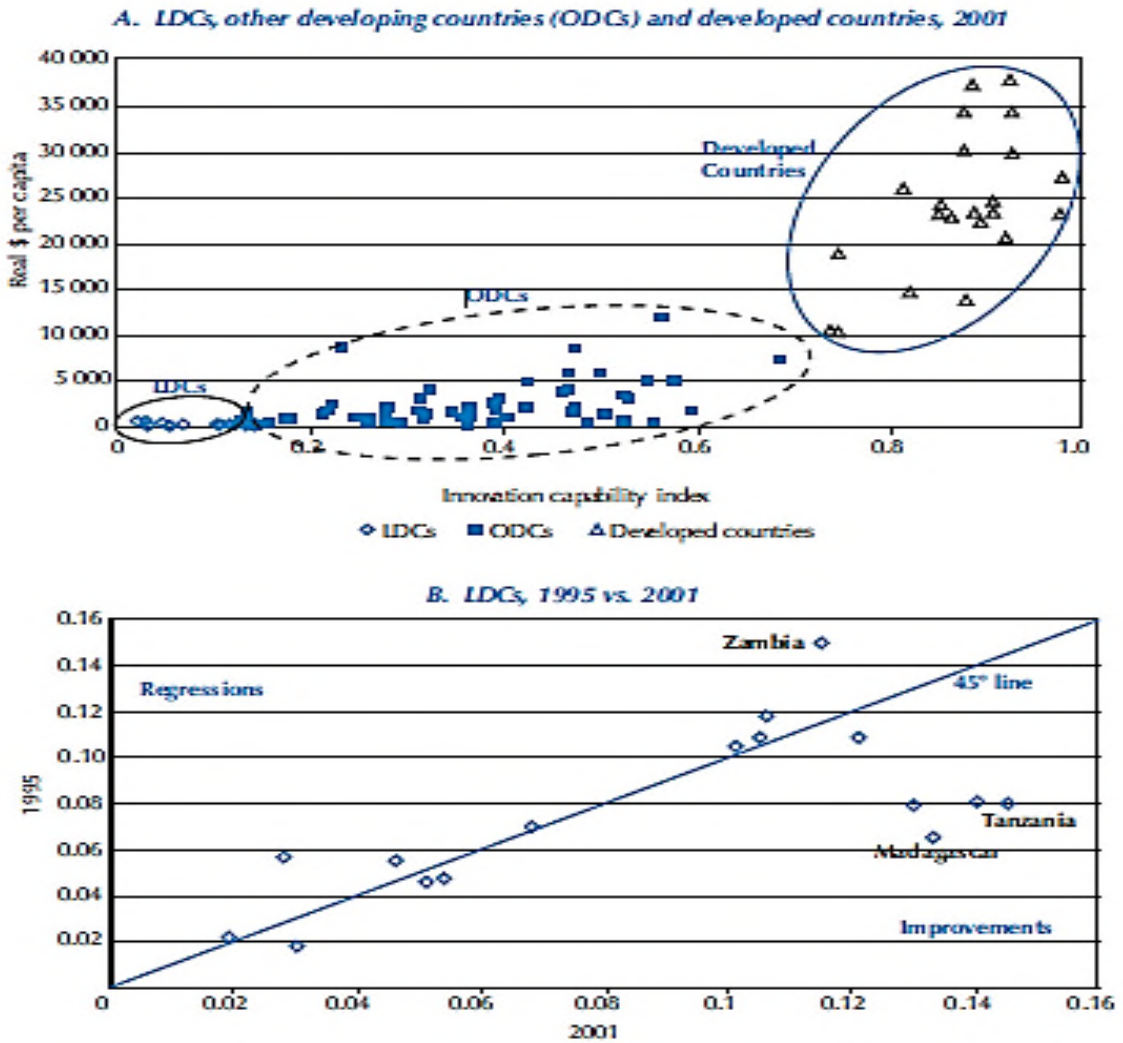
:(1.2)

1995

2001

UNCTAD

:(1.2)



Source: United Nations.(2007, p2)

(R&D)

(Juma,2006)

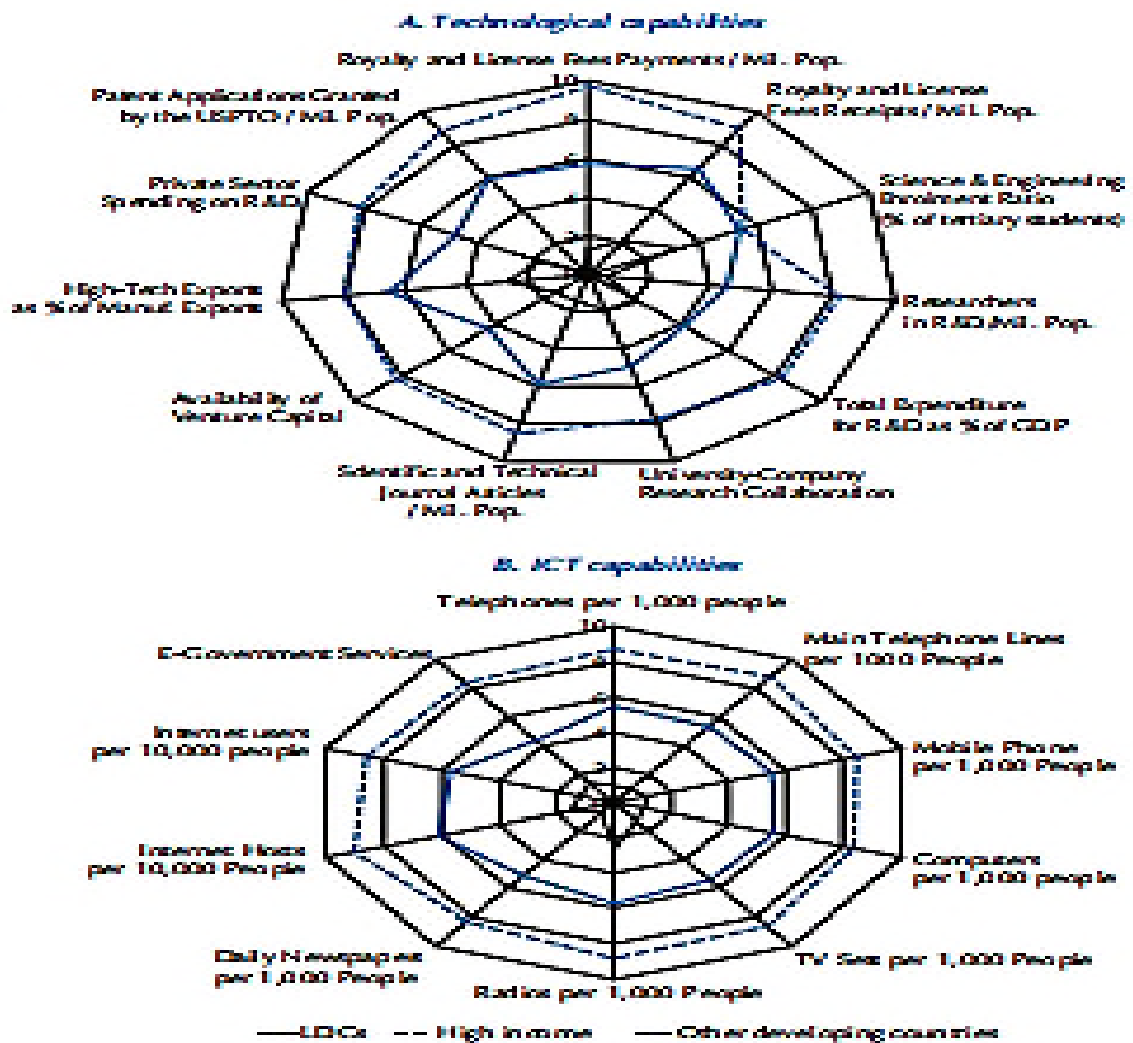
(Patel,2005)

(2.2)

(LDCs)

(LDCs)

:(2.2)



Source: United Nations. (2007, p3)

(LDCs) (1.2)

((R&D))

(LDCs) (LDCs)

:(1.2)

1000 ()	1000 ()				% ()		R&D %	R&D %	
0,9	22,7	/	28,1	/	1,1	0	/	/	
11,1	54	2,4	67,4	18	0,8	3	/	/	
2,2	37	4,2	/	13	6,5	177	/	0,6	
12,2	38,2	2,3	34,7	25	3	20	/	/	
22,3	52,9	/	/	/	/	1	/	/	
4,1	37,4	0,9	21,8	/	1,5	23	17	0,2	
3,4	12,5	2	59,3	10	2,3	3	/	/	
3	39,5	/	73,6	19	2,9	5	/	/	
50,5	281,1	/	/	106	5,6	1	127	/	
2,3	17,6	2,9	48,6	/	1,8	4	/	/	
6,4	14,4	/	25,7	/	0,8	2	/	/	
13,6	26,5	/	/	11	2,3	0	/	/	
	37	/	67,2	/	1,3	6	/	/	

11,6	43,4	/	/	22	1,6	0	/	/	
10,2	106,2	/	87	/	2,6	1	/	/	
11,8	14	/	/	37	1,1	2	/	/	
1,6	7,8	1,9	/	19	2,5	93	/	/	
33,2	99	/	/	21	1,2	17	/	/	
5	15,3	/	29,5	34	2,2	2	251	/	
16,9	7,9	/	/	/	0,4	6	/	/	
59,5	64,2	3,6	/	/	/	1	/	/	
20,4	52,5	/	/	/	/	0	/	/	
3,6	48,2	/	68,7	11	5,9	2	/	/	
23,9	109,1	/	82,2	6	2,8	1	42	0	
0,3	2,8	/	/	/	15,5	1	/	/	
5	19,5	3,7	70,7	20	2,5	/	15	0,1	
3,7	25	4,3	64,1	33	0,4	36	/	/	
59,2	450,7	/	96,3	/	0,2	3	/	/	
3,8	36,2	1,1	19	/	2,1	11	/	/	
4,7	134,5	/	51,2	10	3,5	2	/	/	
7,1	26,9	2,4	/	24	1,2	14	/	0,6	
1,3	10,3	4,4	89,9	42	11,3	10	/	0,1	
6,6	21,8	3,3	48,6	/	5,6	39	59	0,7	
1,8	12,8	1	28,7	/	0,8	21	/	/	
4,3	18,2	/	64,9	/	2,7	4	/	/	
32,7	130,4	/	/	14	7,5	3	/	/	
42,3	72,4	2,6	39,3	/	4,9	62	/	/	
1,9	27,2	3,6	35,1	8	2,1	3	/	/	
6,4	17	/	/	/	/	6	/	/	

25,1	87,9	/	/	/	/	0	/	/	
32,1	58,5	2,9	60,9	/	6.1	43	263	0,3	
/	/	/	/	/	10,2	/	/	/	
36,9	48,1	/	53,2	/	3,6	11	/	/	
7,2	44,4	3,3	66,8	/	3,4	91	24	0,8	
8,9	32,2	3,5	69,4	/	1,2	87	/	/	
36,2	83,3	/	74	/	5	3	/	/	
8,9	92	/	/	/	9,4	10	/	/	
20,1	33,7	6,1	68	/	2,3	26	51	0	

Source : United Nations (2007, p5)

2006 (UNDP) (LDCs)

-2000 %1 -

%40 2003

2003-2000, 1993-1990 10

36 19

-

-2000 %70 -

2003

(23 الى 18%)



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..... (LDCs)

..... 2003-2000 %4

..... (LDCs)

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..... LDCs

(UNCTAD, 2007, p p 179-186).

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..... (LDCs)

United Nations, 2007,)

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(Bhavani, 2002, p p 8-23)



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(2007:).

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John and)

(Chris, 1999

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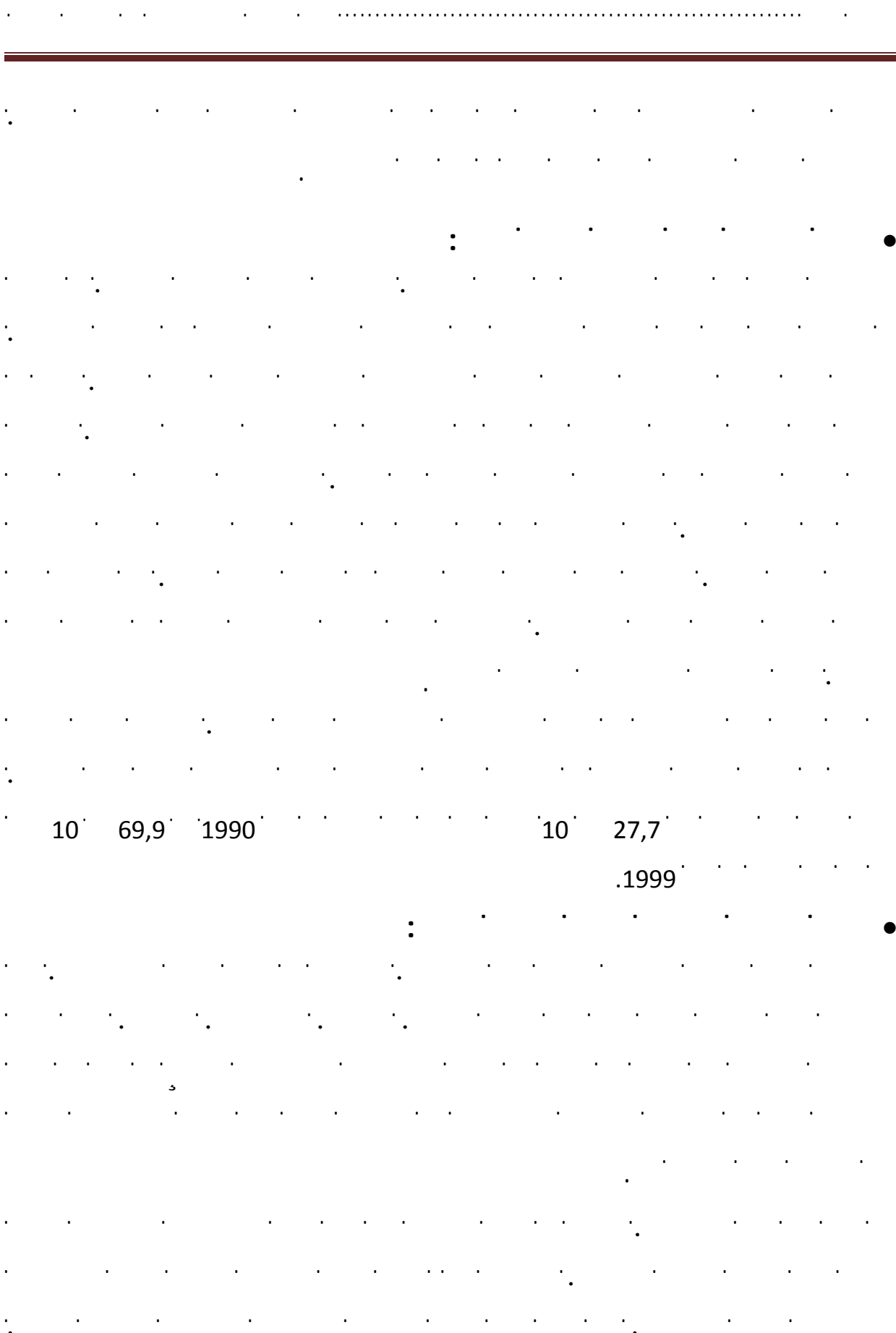
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(Paulo, 2001)



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(Wignaraja, 2001)

(Burns, 2009)

(01)

Trade

Diaspora

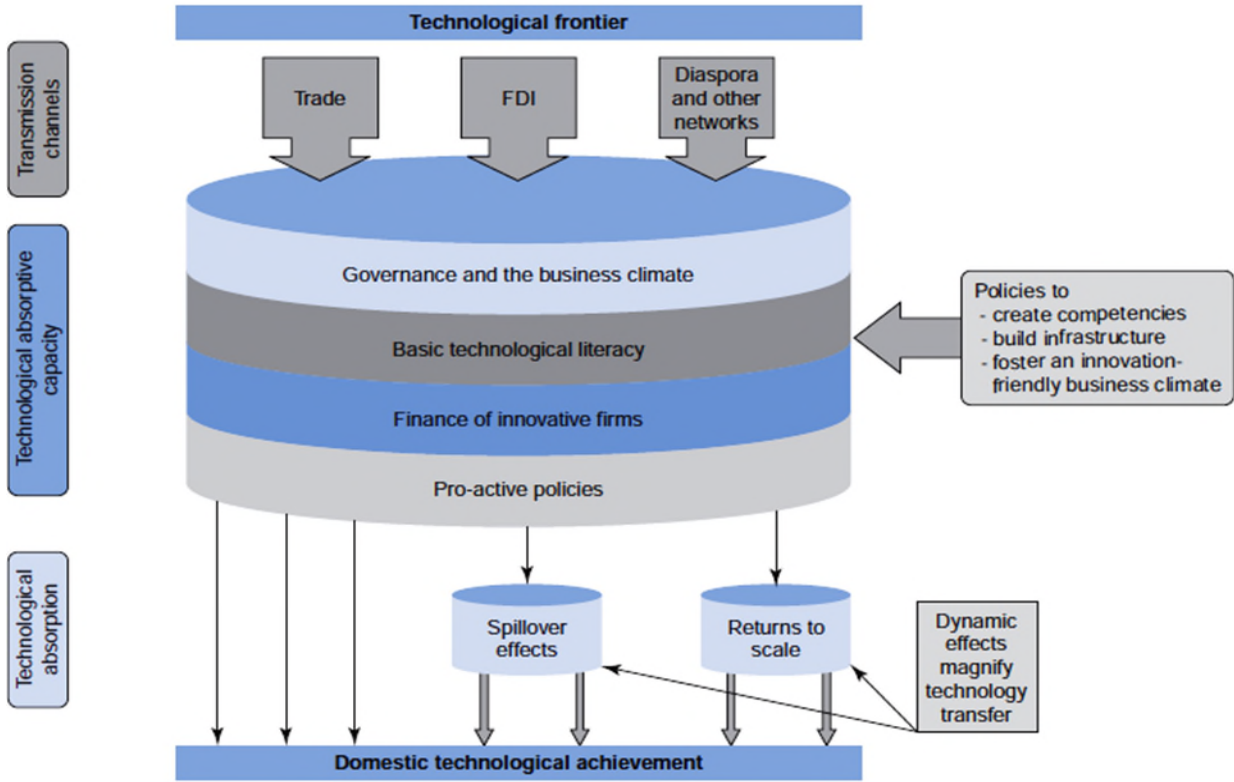
Foreign Direct Investment

Technological Frontier

Oldberg et al, (2008)

Technical Absorptive Capacity

(3.2)



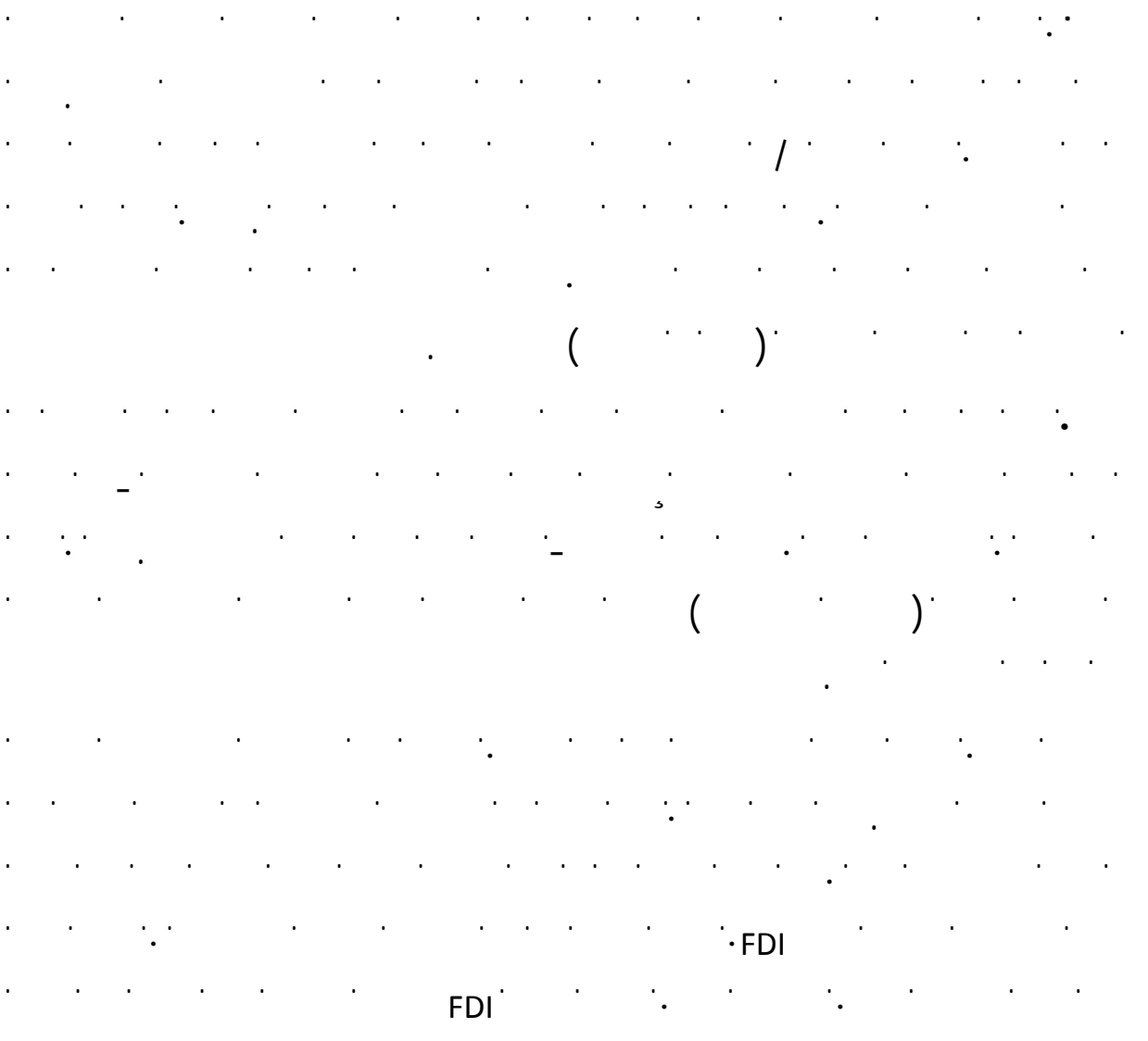
(108 :2008L"

Business Climate

Basic Technological Literacy

Advanced Skills

Primary Channel



Increasing $(1 - \alpha)$
Spillover Effects Returns To Scale

2

Learning by Doing

FDI (Lucas,1988 ;1993)

Financial Sector

(5-3 - 2012)

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(43,42 . 2003.)

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..... (1989) Amsden

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Amsden

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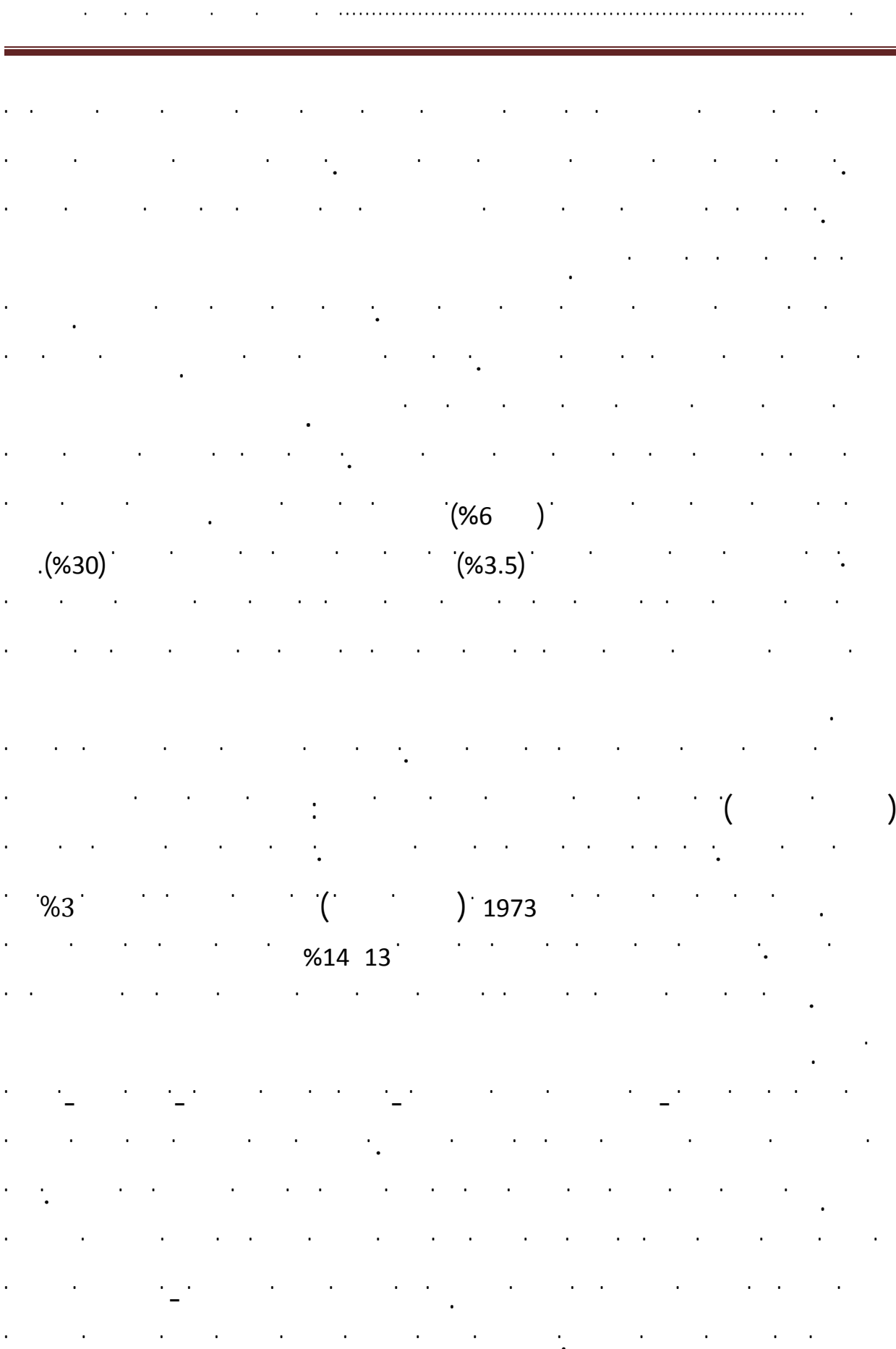


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Lima Declaration

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(.....)



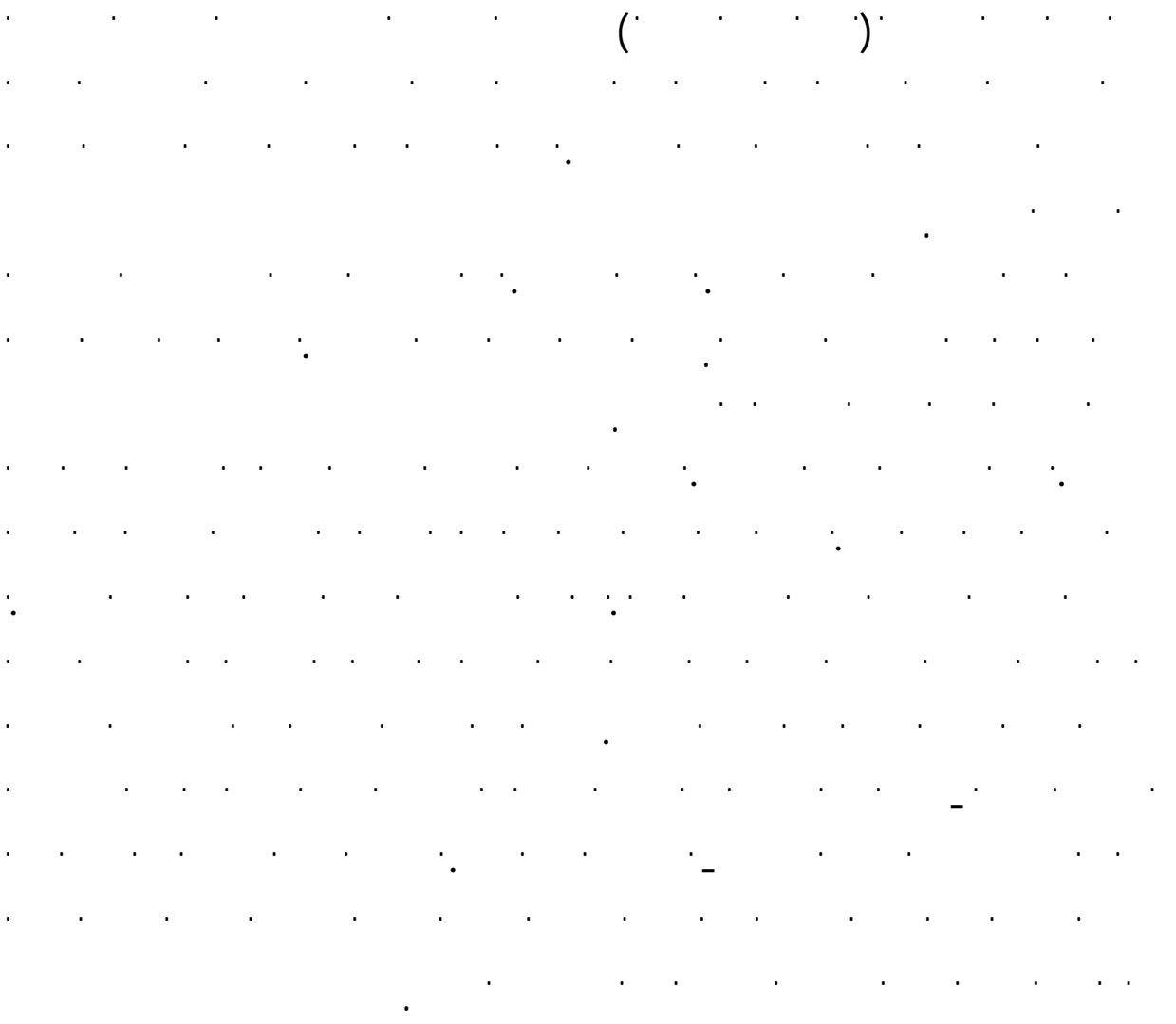
Schumpeter,)

Creative Destruction (1950)

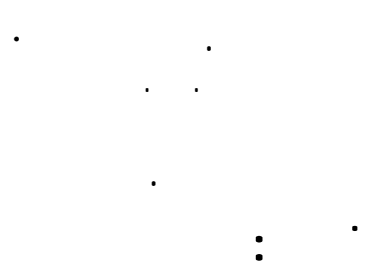
(30-25)

(15-10)

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Capital good imports



(Grossman & Helpman,1991)

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(Goldberg & al,2010)

Bernard & al; 2007 ,)

Ô (Lopez ;2005, Muuls & Pisu;2007

(2007) Almeida and Fernandes و (2009)

)&Lopez, 2005;Alvarez : (TFP)

Taybout,2000 ;Keller,2004;

(Djankov & Hoekman, 2004; Kasahara & Rodrigue, 2005

(2004;2000) Keller

Romer,1990 ;Grossman&)

i(Helpman,1991 ;Kortum,1997 ;Eaton & Kortum,1999,2002

)

(حواس، 2012، ص7-5)

) Keller

(

Keller

– Ceteris Paribus

(Krueger,1983) ()

()

(2001) Mazumdar, (1994) Lee

catch-up

(Zhang & Zou,1995;)¹

Ben-David,1996 ; Ben-David and Rahman,1996 ;)

Caselli and Coleman II,) (Lichtenberg and de la Potterie,1998

Lederman and) (R&D) (2001; Comin and Hobbijn,2004

(Maloney, 2003

(Coe et al,1997) و (1995)Coe and Helpman

770

)R&D

(TFP) (

R&D

2

R&D

1995-1975 77 (2009) Roy

10 GDP (TFP)

0.4 (TFP)

1

Nelson and Phelps,1966 ; المثال)

(Gerschenkron,1952 ; Abramovitz,1979 ;

(Eaton & Kortum 2000 :40-41) 2

R&D North-South Trade -

Lumenga-Neso) R&D \hat{O}
 Regional .³(et al., 2005
) ()
 . (Shiff and Wang,2006) i(
 ()

Caselli)
 (and Coleman II, 2001; Comin and Hobijn,2004 ; Keller,2004
 (Clarke,2007 Parente and Prescott,1991)
 Dahlman et al, 1987;)
 .(Rosenberg, 1976
 .(Pack, 2006)

Relative Price of
)DeLong and Summers, " capital good
 1991(
 GDP) (UNICP)
) (per capita
 DeLong and .(1980 (Deflator) GDP
 " Summers

() (1998) Connolly -³
 (1998) Connolly 30
 GDP

(UNICP) (Summer and Hestan, 1991)
 Aggregate commodities)
 6 60 1980 (groups
 1980 : (1.3)
 (100=)

الكل	6	5	4	3	2	1	
60	6	8	10	10	14	12	
	>%75	60-75	35-60	20-35	10-20	<10	GDP per capita of U.S GDP per % Capita
104	91	96	102	106	105	106	A
115	94	93	95	112	146	155	B
124	84	84	115	131	172	149	C
110	100	99	87	98	135	170	D
1,11	1,03	0,97	0,93	1,06	1,39	1,46	B/A
1,19	0,92	0,83	1,13	1,24	1,64	1,41	C/A
06'1	1,09	1,03	0,85	0,92	1,29	1,6	D/A

Source: Summer and Hestan. (1991, p338)

(1.3)

(1995) De Long and Summers 1985-1960 60 4-
 %10 %8 GDP

£ (relatively expensive)

.(£ 1.55 fl

fl £ "

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(UNICP) Summer and Hestan, (1991)

Summer and Hestan

(Investment Deflator)

(Ratio)

99

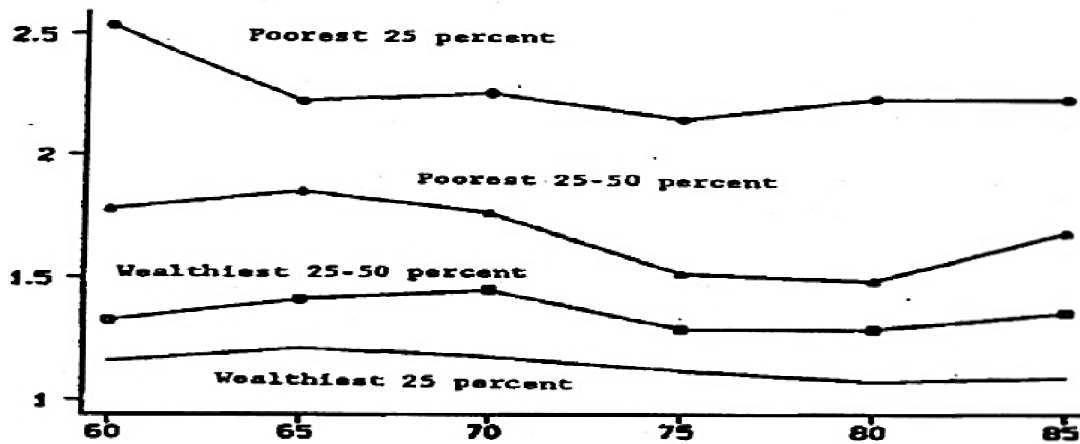
""(Consumption Deflator)

.1960

4

1985-1960j

: (1.3£



Source: Lee. (1995, p27)

"Stable Over Time"

Ebrahimi, 2011;)(Collinsand

Williamson, 2001

Poor) (Richer Countries)

LDCs DCs (Countries

5

50 (GDP)

70 Low-Countries

((2.3) Middle-countries)

East Asia and the Pacific

(18) (37) (8.4)GDP

GDP

Europe and Central Asia

GDP 3.8

3.6 Latin America and the Caribbean

Middle East and North Africa

(4.5)Sub-Saharan Africa

(2007) Hsieh and Klenow -5

() ()

:(2.3)

(GDP %)			(GDP %)			
%	-2002 2004	-1994 1996	%	-2002 2004	-1994 1996	
10	12,8	11,6	42	8,4	5,9	
107	14,7	7,1	125	7,2	3,2	
32	7,2	5,4	61	3,8	2,4	
42	8,9	6,3	44	3,6	2,5	
22	3,8	3,1	53	2,1	1,4	
14	10,5	9,3	39	4,5	3,2	
27	7,0	5,5	38	4,7	3,4	
51	13,1	8,7	71	7,2	4,2	
33	9,2	6,9	70	5,4	3,2	
17	5,7	4,9	53	2,7	1,8	

.(110 :2008). :

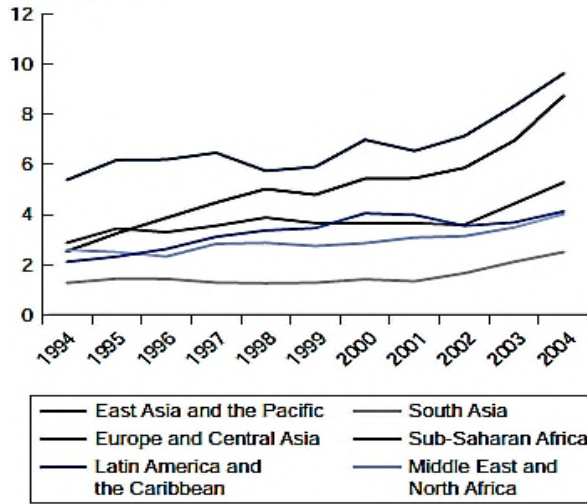
Income Groups

GDP) 2004 3.2 2002 1.8
 .((2.3)

:(2.3)

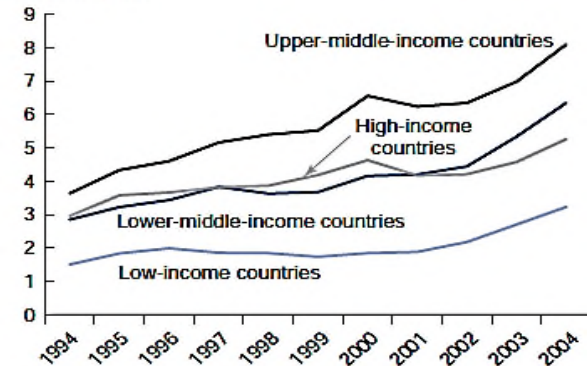
By region

Percent of GDP



By income group

Percent of GDP



.(112 :2008). :

South Asia

i2004-1994

GDP

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(

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GDP

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.(World Bank,2008)

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Middle-Income Countries

(GDP

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	GDP	
Income Countries Upper-middle		
i(13) GDP		51
Lower-middle-income countries		
		33
.(UNCTAD, 2007)	Technological Gap	

	GDP	
	Polices Autarchic	
GDP		
(04-2002)	89	(96- 1994)
		63
		.(9-7 :2012:)

(Eldridge and Harper, 2010)

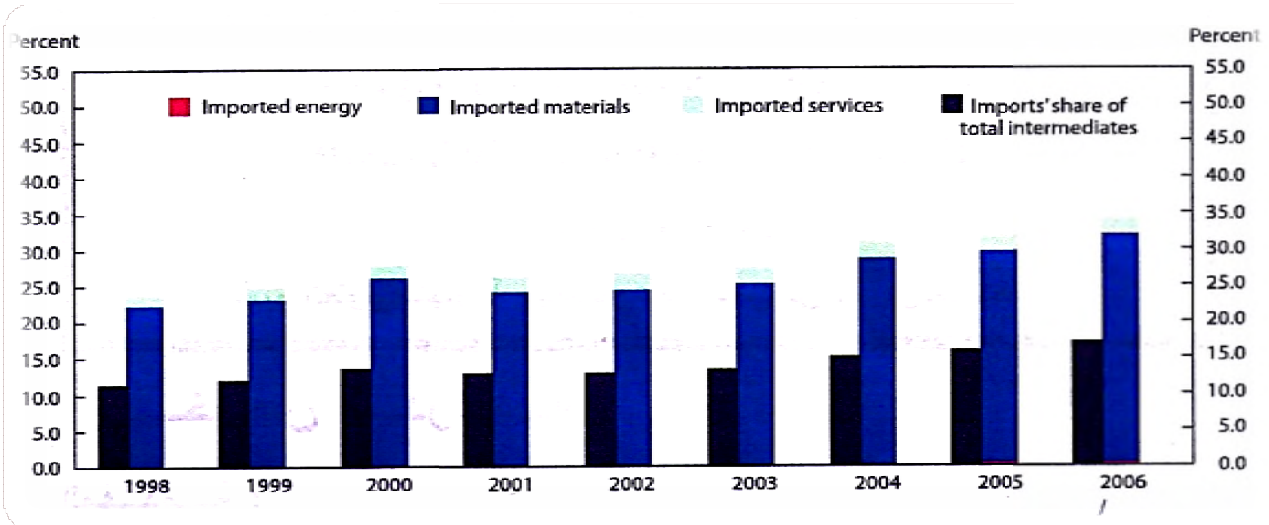
private business sector

%14

%23

: (3.3£

.2006-1998.



Source: Eldridge and Harper. (2010, p7)

%24

1998

2002

2006

%34

i(1956) Solow

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:Models of Capital Formation

·(Romer,1986)

·(Lucas,1988)

·(Grossman & Helpman,1990)

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;(1995)Zhang & Zou;(1993)Devarajan & Zou

(Inputs)

(1995)Zou&Zhang

(Home Country)

·(Foreign Country)

P_x

Negative Function of the Quantity)

·(Exported

Maré,)

·(Without Bound) ↘

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Aghion and

.2004)

(NIC's)

·Howitt,)(1998

(2011)Paul Krugman

-7

·"Relative Backwardness ()"

N_t t
(14 2012):

$$Y(t) = K^\alpha(t)Z^\beta(t)[A(t)N(t)]^{1-(\alpha+\beta)}, (\alpha + \beta < 1) \quad (1)$$

Z(t) t K(t):

8 ()

• $\dot{N}(t)/N(t) = n$ n N(t)

• $A(t) = \ell^{\phi t}$ ϕ t A(t)

Z(t) K(t)

$$\dot{K}(t) = s_k Y(t) - \delta K(t) \quad (2)$$

$$\dot{Z}(t) = s_z Y(t) - \delta Z(t) \quad (3)$$

s_k, s_z

δ

A_t N_t

$$A(t) = A(0)\ell^{\phi t} \dots \dots \dots N(t) = N(0)\ell^{nt} \quad (4)$$

ϕ n

A(0) = 1

$$Y(t) = K^\alpha(t)Z^\beta(t)[N(0)\ell^{(n+\phi)t}]^{1-(\alpha+\beta)} \quad (5)$$

• $\hat{N}(t) = N(t)\ell^{\phi t} = N(0)\ell^{(n+\phi)t}$

$$\hat{y}(t) = \hat{k}^\alpha(t)\hat{z}^\beta(t) \quad (6)$$

$\hat{y}, \hat{k}, \hat{z}$ Y(t) / $\hat{N}(t) = \hat{y}(t), K(t) / \hat{N}(t) = \hat{k}(t), z(t) / \hat{N}(t) = \hat{z}(t)$:

$\hat{k}_h(t)$

$$\begin{aligned} \frac{d\widehat{k}(t)}{dt} &= \frac{d}{dt} \left[\frac{K(t)}{\widehat{N}(t)} \right] = \frac{\dot{K}(t)\widehat{N}(t) - K(t)\dot{\widehat{N}}(t)}{(\widehat{N}(t))^2} = \frac{\dot{K}(t)}{\widehat{N}(t)} - \frac{K(t)}{\widehat{N}(t)} \cdot \frac{\dot{\widehat{N}}(t)}{\widehat{N}(t)} \\ &= \frac{s_k Y(t)}{\widehat{N}(t)} - (n + \phi)\widehat{k}(t) \end{aligned}$$

$$\dot{\widehat{k}}(t) = s_k \widehat{y}(t) - (n + \phi + \delta)\widehat{k}(t) \quad (7)$$

$$\dot{\widehat{z}}(t) = s_z \widehat{y}(t) - (n + \phi + \delta)\widehat{z}(t) \quad (8)$$

$$\left(\begin{array}{c} \widehat{z}^*(t) \\ \vdots \end{array} \right) \mid \widehat{k}^*(t)$$

$$\widehat{z}(t) \mid \widehat{k}(t)$$

$$(8) \quad (7)$$

$$s_k \widehat{y}(t) = (n + \phi + \delta)\widehat{k}(t)$$

$$s_z \widehat{y}(t) = (n + \phi + \delta)\widehat{z}(t)$$

$$\widehat{y}(t) = \widehat{k}^\alpha(t) \widehat{z}^\beta(t)$$

$$\widehat{k}(t)$$

$$\widehat{z}(t)$$

$$s_z \widehat{k}^\alpha(t) \widehat{z}^\beta(t) = (n + \phi + \delta)\widehat{z}(t) \quad (9)$$

$$\widehat{z}^{\beta-1}(t) = \left(\frac{n + \phi + \delta}{s_z} \right) \widehat{k}^{-\alpha}(t)$$

$$\widehat{z}(t) = \left(\frac{s_z}{n + \phi + \delta} \right)^{\frac{1}{1-\beta}} \widehat{k}^{\frac{\alpha}{1-\beta}}(t)$$

$$\widehat{k}(t)$$

$$s_k \widehat{k}^\alpha(t) \left[\left(\frac{s_z}{n + \phi + \delta} \right)^{\frac{1}{1-\beta}} \widehat{k}^{\frac{\alpha}{1-\beta}}(t) \right]^\beta = (n + \phi + \delta)\widehat{k}^\alpha(t)$$

$$\widehat{k}^{\alpha-1}(t) \left(\frac{s_z}{n + \phi + \delta} \right)^{\frac{\beta}{1-\beta}} \widehat{k}^{\frac{\alpha\beta}{1-\beta}}(t) = \left(\frac{n + \phi + \delta}{s_k} \right)$$

$$\widehat{k}^{\frac{(\alpha-1)(1-\beta) + \alpha\beta}{1-\beta}}(t) = \left(\frac{s_z}{n + \phi + \delta} \right)^{\frac{-\beta}{1-\beta}} \left(\frac{s_k}{n + \phi + \delta} \right)^{-1}$$

$$\begin{aligned}
\widehat{k}^{\frac{\alpha+\beta-1}{1-\beta}}(t) &= \left(\frac{s_z}{n+\phi+\delta} \right)^{\frac{-\beta}{1-\beta}} \left(\frac{s_k}{n+\phi+\delta} \right)^{-1} \\
\widehat{k}^*(t) &= \left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{-\beta}{1-\beta}\right)\left(\frac{1-\beta}{\alpha+\beta-1}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{-\left(\frac{1-\beta}{\alpha+\beta-1}\right)} \\
\widehat{k}^*(t) &= \left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{\beta}{1-\alpha-\beta}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{\left(\frac{1-\beta}{1-\alpha-\beta}\right)} \quad (10) \\
&\vdots \quad \widehat{z}(t) \quad \vdots
\end{aligned}$$

$$\begin{aligned}
\widehat{z}^*(t) &= \left[\frac{s_z}{n+\phi+\delta} \right]^{\frac{1}{1-\beta}} \left[\left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{\beta}{1-\alpha-\beta}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{\left(\frac{1-\beta}{1-\alpha-\beta}\right)} \right]^{\frac{\alpha}{1-\beta}} \\
&= \left[\frac{s_z}{n+\phi+\delta} \right]^{\frac{1}{1-\beta}} \left[\left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{\alpha\beta}{(1-\alpha-\beta)(1-\beta)}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{\left(\frac{\alpha(1-\beta)}{(1-\alpha-\beta)(1-\beta)}\right)} \right] \\
&= \left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{(1-\alpha-\beta)(1-\alpha)}{(1-\alpha-\beta)(1-\beta)}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{\left(\frac{\alpha}{1-\alpha-\beta}\right)} \\
&= \left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{(1-\beta)(1-\alpha)}{(1-\alpha-\beta)(1-\beta)}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{\left(\frac{\alpha}{1-\alpha-\beta}\right)} \\
z^*(t) &= \left(\frac{s_z}{n+\phi+\delta} \right)^{\frac{1-\alpha}{1-\alpha-\beta}} \left(\frac{s_k}{n+\phi+\delta} \right)^{\frac{\alpha}{1-\alpha-\beta}} \quad (11) \\
&\vdots \widehat{y}^* \quad \vdots \widehat{z}^*(t) \mid \widehat{k}^*(t) \quad \vdots
\end{aligned}$$

$$\begin{aligned}
\widehat{y}^*(t) &= \widehat{k}^{*\alpha}(t) \widehat{z}^{*\beta}(t) \\
&= \left[\left(\frac{s_z}{n+\phi+\delta} \right)^{\left(\frac{\beta}{1-\alpha-\beta}\right)} \left(\frac{s_k}{n+\phi+\delta} \right)^{\left(\frac{1-\beta}{1-\alpha-\beta}\right)} \right]^{\alpha} \left[\left(\frac{s_z}{n+\phi+\delta} \right)^{\frac{1-\alpha}{1-\alpha-\beta}} \left(\frac{s_k}{n+\phi+\delta} \right)^{\frac{\alpha}{1-\alpha-\beta}} \right]^{\beta} \\
&= \left(\frac{s_z}{n+\phi+\delta} \right)^{\frac{\beta-\alpha\beta+\alpha\beta}{1-\alpha-\beta}} \left(\frac{s_k}{n+\phi+\delta} \right)^{\frac{\alpha-\alpha\beta+\alpha\beta}{1-\alpha-\beta}} \\
\widehat{y}^*(t) &= \left(\frac{s_z}{n+\phi+\delta} \right)^{\frac{\beta}{1-\alpha-\beta}} \left(\frac{s_k}{n+\phi+\delta} \right)^{\frac{\alpha}{1-\alpha-\beta}} \quad (12)
\end{aligned}$$

$$\widehat{k}(t) = \frac{K(t)}{\widehat{N}(t)} = \frac{K(t)}{N(0)\ell^{(n+\phi)t}} = \frac{K(t)}{N(0)\ell^{nt} \cdot \ell^{\phi t}} = k(t) \cdot \frac{1}{\ell^{\phi t}}$$

$$\lim_{t \rightarrow \infty^+} \widehat{k}^*(t) = \left(\frac{s_k^{1-\beta} s_z^\beta}{n + \phi + \delta} \right)^{\left(\frac{1}{1-\alpha-\beta} \right)} = \lim_{t \rightarrow \infty^+} k(t) \cdot \frac{1}{\ell^{\phi t}} \quad (13)$$

$$\lim_{t \rightarrow \infty^+} k(t) = \left(\frac{s_k^{1-\beta} s_z^\beta}{n + \phi + \delta} \right)^{\left(\frac{1}{1-\alpha-\beta} \right)} \cdot \ell^{\phi t} \quad (14)$$

Simon and (1977) Boyce and DiPrima

(2009) Acemoglu (2009) De La Grandville (1994) Bloom

$$k(t) = \left[\left(k^{1-\alpha-\beta}(0) - \left(\frac{s_k}{n + \phi + \delta} \right)^{(1-\beta)} \left(\frac{s_z}{n + \phi + \delta} \right)^\beta \right) \ell^{-(n+\delta)(1-\alpha-\beta)t} + \left(\frac{s_k}{n + \phi + \delta} \right)^{1-\beta} \left(\frac{s_z}{n + \phi + \delta} \right)^\beta \ell^{\phi(1-\alpha-\beta)t} \right]^{\left(\frac{1}{1-\alpha-\beta} \right)} \quad (15)$$

$$z(t) = \left[\left(z^{1-\alpha-\beta}(0) - \left(\frac{s_k}{n + \phi + \delta} \right)^\alpha \left(\frac{s_z}{n + \phi + \delta} \right)^{1-\alpha} \right) \ell^{-(n+\delta)(1-\alpha-\beta)t} + \left(\frac{s_k}{n + \phi + \delta} \right)^\alpha \left(\frac{s_z}{n + \phi + \delta} \right)^{1-\alpha} \ell^{\phi(1-\alpha-\beta)t} \right]^{\left(\frac{1}{1-\alpha-\beta} \right)} \quad (16)$$

$$Y(t) = K^\alpha(t) Z^\beta(t) N^{1-\alpha-\beta}(t) \ell^{\phi(1-\alpha-\beta)t} \quad (5)$$

$$Y(t)/N(t) = k^\alpha(t) z^\beta(t) \ell^{\phi(1-\alpha-\beta)t}$$

(17)

$$y(t) = \ell^{\phi(1-\alpha-\beta)t} \cdot \left[\left((k^{1-\alpha-\beta}(0)) - \left(\frac{s_k}{n+\phi+\delta} \right)^{(1-\beta)} \left(\frac{s_z}{n+\phi+\delta} \right)^\beta \right) \ell^{-(n+\delta)(1-\alpha-\beta)t} + \left(\frac{s_k}{n+\phi+\delta} \right)^{1-\beta} \left(\frac{s_z}{n+\phi+\delta} \right)^\beta \ell^{\phi(1-\alpha-\beta)t} \right]^{\left(\frac{\alpha}{1-\alpha-\beta} \right)} \times$$

$$\left[\left((z^{1-\alpha-\beta}(0)) - \left(\frac{s_k}{n+\phi+\delta} \right)^\alpha \left(\frac{s_z}{n+\phi+\delta} \right)^{1-\alpha} \right) \ell^{-(n+\delta)(1-\alpha-\beta)t} + \left(\frac{s_k}{n+\phi+\delta} \right)^\alpha \left(\frac{s_z}{n+\phi+\delta} \right)^{1-\alpha} \ell^{\phi(1-\alpha-\beta)t} \right]^{\left(\frac{\beta}{1-\alpha-\beta} \right)}$$

$$\lim_{t \rightarrow \infty^+} \dot{y}(t)/y(t) = \frac{\alpha}{1-\alpha-\beta} \phi(1-\alpha-\beta) + \frac{\beta}{1-\alpha-\beta} \phi(1-\alpha-\beta) + \phi(1-\alpha-\beta) = \phi \quad (18)$$

$$\lim_{t \rightarrow \infty^+} \dot{k}(t)/k(t) = \left(\frac{1}{1-\alpha-\beta} \right) \phi(1-\alpha-\beta) = \phi \quad (19)$$

$$\lim_{t \rightarrow \infty^+} \dot{z}(t)/z(t) = \left(\frac{1}{1-\alpha-\beta} \right) \phi(1-\alpha-\beta) = \phi \quad (20)$$

(20) (19) (18)

$$\hat{O} \dots \phi = \Phi(\hat{z}^*)$$

(Higher)

()

$$\Phi(\hat{z}^*) > \phi_f \quad ()$$

$(\phi = \phi_f)$
) "Catching-Up"
 $()$
 $()$
 (Lucas, (Solow, 1956)
 1988 ; Romer ,1986).
 Zhang &)
 (Zou,1995Lee,1995 ;
 $()$ $()$
 (Grossman and Helpman,1991)
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قائمة المراجع

	i	i(2007)	-1
		i(2010) i	-2
		i ²⁵	
		i(2011) i	-3
	i	i(2006) i	-4
		i(2007)i	-5
		:	
		i(2002) i	-6
		.4 i ⁴²	
	" "	" i(2005) i	-7
	i ¹⁷	i"	
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	i"	:	
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		i	
		i(2012)	-11
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		i(2012)	-12
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	i	i(2009)	-13
		:	
		i(2000)	-14
.10		:	
		i(2011)	-15
		:	
		i(2005) i	-16
		.2003-1976	

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